



ChemCam is having a blast on Mars

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Following the successful landing of the Mars rover Curiosity on August 5, Lab scientists and their French counterparts have already begun firing its onboard laser and collecting data. The scientists hope to collect results from 14,000 tests during the two years scheduled for the mission (equivalent to one Mars year). The ChemCam laser onboard the rover directs the equivalent energy of a million light bulbs into a spot the size of a pinhead and in five nanoseconds vaporizes what it hits. The resulting plasma is then read by three compact optical spectrometers to determine the chemical composition of what's just been vaporized. The mission's ultimate goal is to determine if the planet holds the chemical building blocks of life as we know it.

During its time on the planet, the rover will move to various locations within the Gale Crater to test different types of rock. One reason the location was selected was the 5 km (3 mile) mound of sedimentary materials at the center of the crater. Scientists targeted sedimentary materials as the best place to look for signs of habitability. Additionally, it is hoped that by investigating this thick sedimentary layering, a much better understanding of Mars' climate history will emerge.

Initial results show the plasma bursts' resulting signals are even better than those from tests conducted on Earth, since the Mars atmosphere is only one percent as dense. The plasmas are less confined in this thin atmosphere, so they are bigger and brighter. Scientists are already poring over what's being transmitted to Earth at the end of each Mars day and will eventually make what they're learning known to the world.

It was a relief when initial tests showed the ChemCam equipment was working as expected. Roger Wiens, the Lab's principal investigator for ChemCam, gave a lot of credit to the NASA's Jet Propulsion Laboratory for placing the rover safely on the planet's surface. ChemCam is one of ten different experiments housed on the almost-one-ton vehicle, and multiple teams work together to determine which experiments are done and when.

As with other high-profile endeavors, the Mars Science Laboratory (the official name for the mission) has spawned parodies. One on Twitter is "N165 aka Coronation" (the name of the first rock used to test the laser) with posts like:

"Come on, guys, I know you're just fooling. What are the chances? Out of all the rocks on Mars, a killer robot would pick me? Haha! :)"

"OW OW OW! STOP IT!"

"My evening: watching a beautiful blue sunset, hanging out with the other basalts, comparing our new tattoos."

The mission has garnered worldwide attention, and more than 400 people showed up at LANL's Bradbury Science Museum to watch the 11:30 p.m. (MDT) landing and hear Lab scientists explain what they were witnessing. Museum staff had to scramble to set up additional viewing locations for the larger-than-anticipated crowd.

In addition to Lab scientists, the ChemCam instrument is jointly operated by specialists from the Institut de Recherche en Astrophysique et Planetologie and the Centre National d'Etude Spatiale in Toulouse, France. Additional ChemCam scientists hail from more than fifteen institutions across France, Canada, the United Kingdom, and United States. The ChemCam project is led by LANL.

To view ChemCam webpages, go to <http://www.msl-chemcam.com/>.

Curiosity mission progress can be followed at <http://mars.jpl.nasa.gov/msl/>.

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